

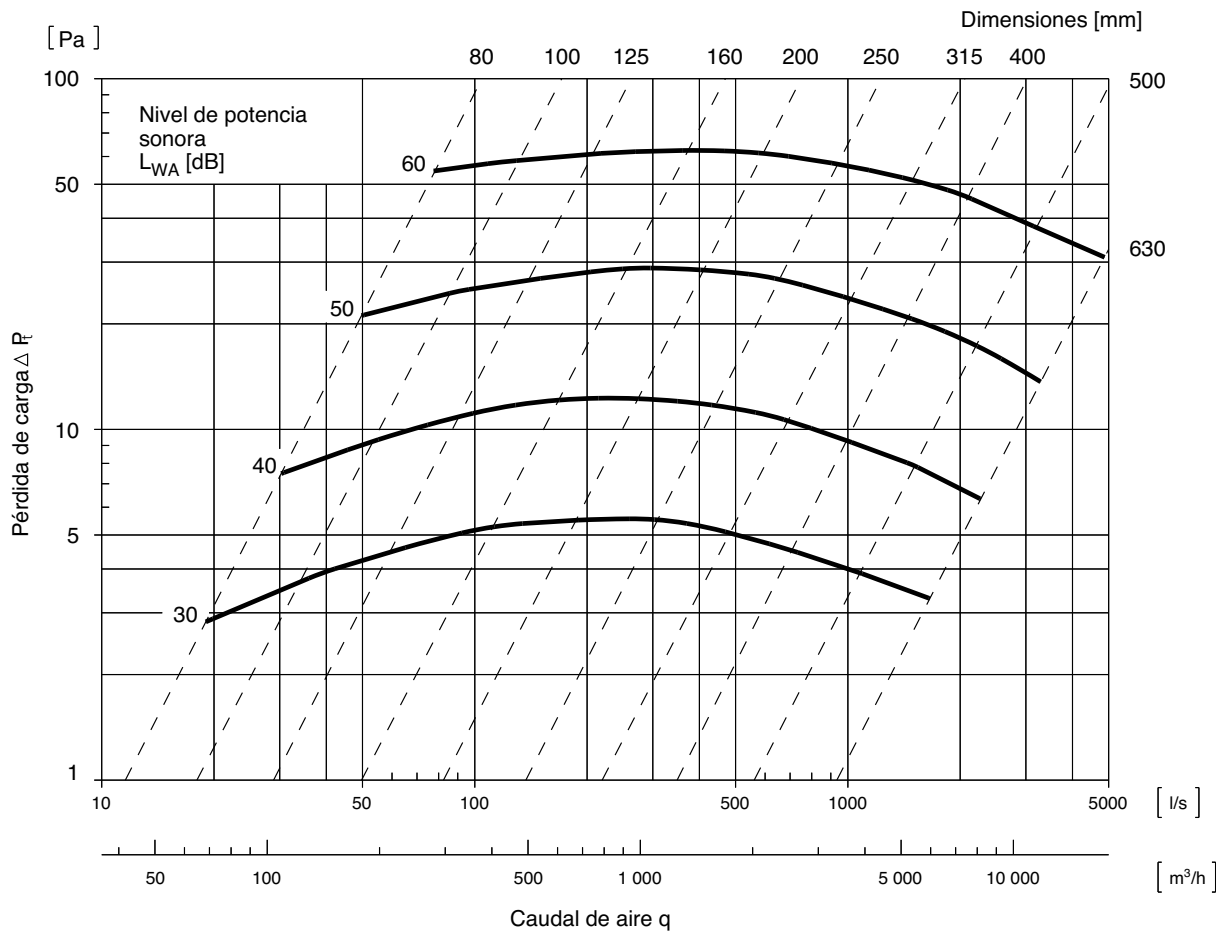
Datos técnicos

Diagrama de pérdida de carga para el dimensionado de FMI

Las líneas discontinuas indican la pérdida de carga en la toma de medición en función del caudal q . Las líneas continuas indican el nivel de potencia sonora ponderado en A del tubo $L_w(A)$ en dB.

Método de medición del nivel sonoro

El sonido generado ha sido medido por el instituto sueco nacional de ensayos de materiales (Statens Provningsanstalt) en una sala de reverberación conforme a ISO 5135 e ISO 3741, e indica el nivel de potencia sonora ponderado en A del tubo $L_w(A)$.



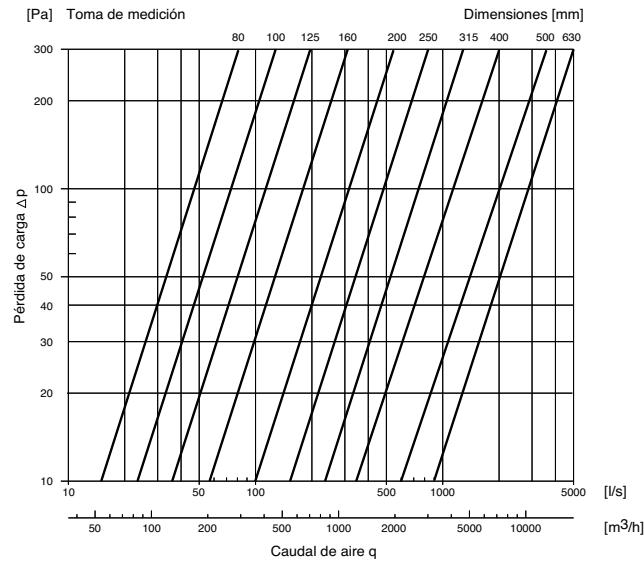
Nota:

Los datos relativos a la pérdida de carga en caso de regulación del caudal difieren de este diagrama.

Datos técnicos

Diagrama de regulación

La curva indica el caudal q en función de la pérdida de carga en la toma de medición:



Nota:

Los datos de pérdida de carga para el dimensionado difieren de este diagrama.

El caudal puede calcularse también a partir de la fórmula:

$$q = k \cdot \sqrt{\Delta p}$$

k : véase la tabla

Δp : pérdida de carga en la toma de medición.

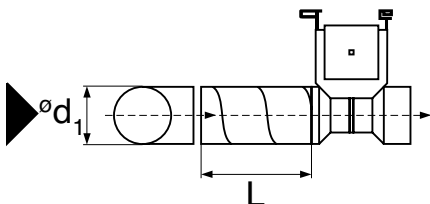
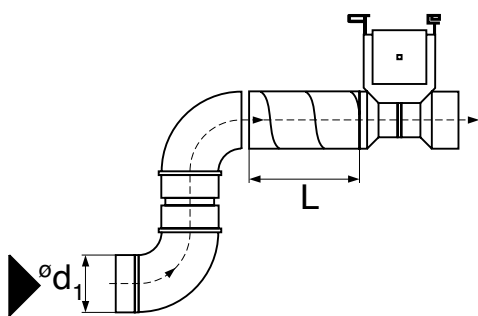
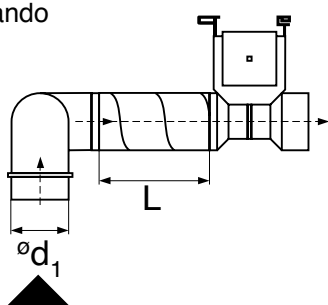
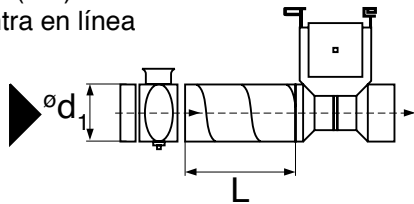
| $\varnothing d$ mm | l/s | m³/h |
|-----------------------|-------|---------|
| 80 | 4,78 | 17,2 |
| 100 | 7,32 | 26,4 |
| 125 | 11,2 | 40,3 |
| 160 | 18,0 | 64,8 |
| 200 | 30,6 | 110,2 |
| 250 | 45,7 | 164,5 |
| 315 | 73,3 | 264,0 |
| 400 | 112,0 | 403,0 |
| 500 | 191,0 | 688,0 |
| 630 | 283,0 | 1.019,0 |

La tabla muestra el factor k en función de si se desean expresar los resultados en l/s o en m³/h.

Datos técnicos

Precisión de la medición

En la tabla se especifica la longitud mínima requerida para una sección de tubo recta antes del medidor de caudal con el fin de limitar los errores de método al 5 %

| S = sección de tubo recta antes del medidor de caudal | Error de método |
|--|-----------------|
| Ejemplos de colocación del tubo | $m_2 = 5\%$ |
| Codo de 90°  | $2 \times d_1$ |
| Dos codos de 90° en el mismo plano  | $1 \times d_1$ |
| Dos codos de 90° formando un ángulo recto entre sí  | $1 \times d_1$ |
| Registro giratorio (45°) El eje se encuentra en línea con las tomas de medición.  | $4 \times d_1$ |

No se requiere ninguna sección de tubo recta después del medidor de caudal. d_1 indica el diámetro nominal del tubo.

Datos técnicos

Datos de sonido para FMI

Nivel de potencia sonora L_w (dB) del tubo en bandas de frecuencia 63-8000 Hz.

| dim. ø _{d1} | Velocidad aprox. 5 m/s | | | | | | | | Velocidad aprox. 10 m/s | | | | | | | | Velocidad aprox. 15 m/s | | | | | | | |
|-------------------------|-------------------------|-----|-----|-----|----|----|----|----|-------------------------|-----|-----|-----|----|----|----|----|-------------------------|-----|-----|-----|----|----|----|----|
| | Frecuencia en Hz | | | | | | | | Frecuencia en Hz | | | | | | | | Frecuencia en Hz | | | | | | | |
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80 | Caudal de aire 25 l/s | | | | | | | | Caudal de aire 50 l/s | | | | | | | | Caudal de aire 75 l/s | | | | | | | |
| | 49 | 45 | 42 | 33 | 22 | 14 | 11 | 11 | 54 | 56 | 56 | 51 | 42 | 34 | 29 | 21 | 68 | 62 | 61 | 59 | 54 | 44 | 41 | 34 |
| 100 | Caudal de aire 40 l/s | | | | | | | | Caudal de aire 80 l/s | | | | | | | | Caudal de aire 120 l/s | | | | | | | |
| | 50 | 45 | 39 | 30 | 18 | 6 | 2 | 7 | 51 | 58 | 54 | 48 | 38 | 30 | 22 | 18 | 60 | 64 | 62 | 59 | 50 | 43 | 38 | 34 |
| 125 | Caudal de aire 60 l/s | | | | | | | | Caudal de aire 120 l/s | | | | | | | | Caudal de aire 180 l/s | | | | | | | |
| | 45 | 40 | 33 | 24 | 11 | 1 | 1 | 8 | 53 | 55 | 50 | 42 | 34 | 26 | 21 | 16 | 61 | 62 | 61 | 53 | 45 | 38 | 35 | 33 |
| 160 | Caudal de aire 100 l/s | | | | | | | | Caudal de aire 200 l/s | | | | | | | | Caudal de aire 300 l/s | | | | | | | |
| | 41 | 39 | 31 | 24 | 13 | 0 | 0 | 3 | 58 | 54 | 50 | 42 | 34 | 27 | 19 | 15 | 66 | 64 | 61 | 52 | 46 | 41 | 35 | 31 |
| 200 | Caudal de aire 150 l/s | | | | | | | | Caudal de aire 300 l/s | | | | | | | | Caudal de aire 450 l/s | | | | | | | |
| | 41 | 36 | 32 | 23 | 7 | 0 | 0 | 4 | 55 | 52 | 47 | 39 | 30 | 23 | 20 | 17 | 64 | 62 | 58 | 48 | 42 | 38 | 34 | 31 |
| 250 | Caudal de aire 250 l/s | | | | | | | | Caudal de aire 500 l/s | | | | | | | | Caudal de aire 750 l/s | | | | | | | |
| | 44 | 37 | 31 | 22 | 17 | 15 | 17 | 17 | 64 | 53 | 48 | 39 | 28 | 27 | 26 | 22 | 72 | 64 | 58 | 49 | 44 | 40 | 39 | 29 |
| 315 | Caudal de aire 400 l/s | | | | | | | | Caudal de aire 800 l/s | | | | | | | | Caudal de aire 1200 l/s | | | | | | | |
| | 51 | 35 | 29 | 19 | 14 | 10 | 5 | 6 | 64 | 55 | 46 | 38 | 34 | 31 | 32 | 28 | 72 | 65 | 57 | 48 | 45 | 42 | 42 | 41 |
| 400 | Caudal de aire 600 l/s | | | | | | | | Caudal de aire 1200 l/s | | | | | | | | Caudal de aire 1800 l/s | | | | | | | |
| | 46 | 37 | 30 | 22 | 19 | 14 | 9 | 7 | 61 | 55 | 47 | 40 | 36 | 34 | 33 | 29 | 72 | 65 | 57 | 50 | 47 | 45 | 44 | 43 |
| 500 | Caudal de aire 1000 l/s | | | | | | | | Caudal de aire 2000 l/s | | | | | | | | Caudal de aire 3000 l/s | | | | | | | |
| | 50 | 40 | 29 | 24 | 22 | 15 | 8 | 5 | 64 | 58 | 47 | 41 | 40 | 40 | 37 | 30 | 75 | 69 | 59 | 53 | 51 | 52 | 51 | 46 |
| 630 | Caudal de aire 1500 l/s | | | | | | | | Caudal de aire 3000 l/s | | | | | | | | Caudal de aire 4500 l/s | | | | | | | |
| | 53 | 43 | 32 | 28 | 25 | 19 | 14 | 10 | 68 | 61 | 50 | 44 | 43 | 45 | 42 | 35 | 78 | 73 | 62 | 56 | 54 | 58 | 57 | 48 |

Datos técnicos

Datos de sonido para FMI con registro de regulación DRU

Nivel de potencia sonora L_w (dB) del tubo en bandas de frecuencia 63-8000 Hz en función del caudal y de la pérdida de carga.

| dim od, (Pa) | Pérdida de carga | Velocidad aproximada 5 m/s | | | | | | | | Velocidad aproximada 10 m/s | | | | | | | | Velocidad aproximada 15 m/s | | | | | | | |
|--------------------|------------------------|----------------------------|-----|-----|-----|----|----|----|----|-----------------------------|-----|-----|-----|----|----|----|-------------------------------------|-----------------------------|-----|-----|-----|----|----|----|----|
| | | Frecuencia en Hz | | | | | | | | Frecuencia en Hz | | | | | | | | Frecuencia en Hz | | | | | | | |
| | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80 | | Caudal de aire 25 l/s | | | | | | | | Caudal de aire 50 l/s | | | | | | | | Caudal de aire 75 l/s | | | | | | | |
| | 500 | 64 | 65 | 62 | 59 | 57 | 56 | 52 | 51 | 68 | 76 | 76 | 70 | 64 | 61 | 59 | 56 | 71 | 80 | 80 | 73 | 67 | 63 | 61 | 58 |
| | 300 | 61 | 62 | 58 | 55 | 52 | 50 | 45 | 43 | 65 | 75 | 75 | 67 | 61 | 57 | 53 | 49 | 68 | 79 | 77 | 68 | 63 | 58 | 55 | 52 |
| | 200 | 59 | 60 | 56 | 51 | 47 | 46 | 40 | 38 | 63 | 75 | 74 | 64 | 58 | 53 | 48 | 44 | 67 | 78 | 75 | 64 | 59 | 54 | 51 | 47 |
| | 100 | 56 | 56 | 51 | 45 | 40 | 38 | 30 | 28 | 59 | 74 | 72 | 59 | 52 | 47 | 40 | 35 | 63 | 76 | 71 | 58 | 53 | 48 | 42 | 38 |
| 50 | 52 | 52 | 47 | 40 | 33 | 30 | 21 | 18 | 56 | 73 | 71 | 54 | 47 | 41 | 32 | 26 | La pérdida de carga sobrepasa 50 Pa | | | | | | | | |
| 100 | | Caudal de aire 40 l/s | | | | | | | | Caudal de aire 80 l/s | | | | | | | | Caudal de aire 120 l/s | | | | | | | |
| | 500 | 64 | 63 | 62 | 58 | 56 | 55 | 53 | 54 | 67 | 76 | 76 | 69 | 63 | 60 | 61 | 61 | 70 | 81 | 82 | 70 | 66 | 64 | 64 | 64 |
| | 300 | 61 | 60 | 58 | 54 | 51 | 50 | 46 | 46 | 65 | 76 | 76 | 65 | 59 | 55 | 56 | 56 | 68 | 81 | 80 | 65 | 62 | 60 | 60 | 59 |
| | 200 | 59 | 58 | 55 | 51 | 47 | 46 | 40 | 40 | 62 | 75 | 75 | 62 | 55 | 51 | 52 | 53 | 65 | 81 | 79 | 61 | 58 | 57 | 56 | 55 |
| | 100 | 56 | 54 | 51 | 45 | 40 | 40 | 31 | 30 | 59 | 75 | 75 | 57 | 49 | 44 | 46 | 46 | 62 | 81 | 78 | 54 | 52 | 51 | 50 | 49 |
| 50 | 52 | 50 | 46 | 39 | 34 | 33 | 22 | 20 | 55 | 75 | 74 | 52 | 43 | 37 | 39 | 40 | La pérdida de carga sobrepasa 50 Pa | | | | | | | | |
| 125 | | Caudal de aire 60 l/s | | | | | | | | Caudal de aire 120 l/s | | | | | | | | Caudal de aire 180 l/s | | | | | | | |
| | 500 | 66 | 64 | 62 | 59 | 56 | 56 | 54 | 53 | 72 | 76 | 75 | 68 | 63 | 60 | 61 | 59 | 75 | 81 | 79 | 71 | 66 | 63 | 63 | 61 |
| | 300 | 63 | 61 | 58 | 55 | 51 | 51 | 47 | 45 | 69 | 75 | 73 | 65 | 59 | 56 | 55 | 53 | 73 | 79 | 76 | 67 | 62 | 59 | 58 | 56 |
| | 200 | 61 | 59 | 56 | 51 | 47 | 47 | 42 | 40 | 67 | 74 | 71 | 62 | 56 | 52 | 50 | 49 | 71 | 78 | 74 | 63 | 58 | 55 | 53 | 51 |
| | 100 | 57 | 55 | 51 | 46 | 41 | 40 | 33 | 30 | 64 | 72 | 69 | 57 | 50 | 45 | 43 | 41 | 67 | 76 | 70 | 57 | 52 | 49 | 46 | 43 |
| 50 | 53 | 51 | 46 | 40 | 35 | 32 | 25 | 21 | 60 | 71 | 66 | 51 | 44 | 38 | 36 | 34 | La pérdida de carga sobrepasa 50 Pa | | | | | | | | |
| 160 | | Caudal de aire 100 l/s | | | | | | | | Caudal de aire 200 l/s | | | | | | | | Caudal de aire 300 l/s | | | | | | | |
| | 500 | 66 | 63 | 61 | 57 | 54 | 54 | 53 | 52 | 77 | 78 | 73 | 67 | 63 | 59 | 59 | 58 | 80 | 81 | 76 | 71 | 66 | 62 | 61 | 59 |
| | 300 | 63 | 60 | 57 | 53 | 50 | 49 | 47 | 45 | 75 | 77 | 70 | 63 | 59 | 54 | 54 | 53 | 78 | 79 | 72 | 67 | 62 | 57 | 55 | 53 |
| | 200 | 61 | 58 | 55 | 50 | 47 | 45 | 42 | 40 | 74 | 75 | 68 | 60 | 56 | 50 | 49 | 48 | 76 | 77 | 69 | 64 | 58 | 53 | 50 | 48 |
| | 100 | 58 | 54 | 50 | 45 | 41 | 38 | 34 | 31 | 71 | 73 | 64 | 55 | 51 | 43 | 42 | 41 | 74 | 74 | 63 | 59 | 53 | 46 | 42 | 39 |
| 50 | 55 | 51 | 45 | 39 | 36 | 31 | 26 | 23 | 69 | 71 | 60 | 50 | 46 | 36 | 34 | 33 | 71 | 71 | 58 | 54 | 47 | 39 | 34 | 31 | |
| 200 | | Caudal de aire 150 l/s | | | | | | | | Caudal de aire 300 l/s | | | | | | | | Caudal de aire 450 l/s | | | | | | | |
| | 500 | 71 | 68 | 65 | 61 | 58 | 58 | 57 | 55 | 77 | 78 | 74 | 68 | 64 | 62 | 63 | 61 | 80 | 82 | 78 | 71 | 67 | 65 | 66 | 63 |
| | 300 | 67 | 64 | 60 | 57 | 53 | 53 | 50 | 47 | 74 | 75 | 71 | 64 | 60 | 57 | 57 | 55 | 77 | 79 | 74 | 67 | 63 | 60 | 60 | 57 |
| | 200 | 65 | 61 | 57 | 53 | 49 | 49 | 45 | 42 | 71 | 73 | 68 | 61 | 56 | 53 | 52 | 50 | 74 | 77 | 71 | 63 | 58 | 56 | 55 | 52 |
| | 100 | 60 | 56 | 52 | 48 | 43 | 41 | 36 | 32 | 66 | 69 | 64 | 55 | 50 | 46 | 45 | 42 | 70 | 71 | 66 | 57 | 52 | 50 | 48 | 44 |
| 50 | 55 | 52 | 46 | 42 | 37 | 34 | 28 | 23 | 62 | 66 | 60 | 50 | 44 | 38 | 37 | 34 | 65 | 69 | 61 | 50 | 46 | 41 | 40 | 35 | |
| 250 | | Caudal de aire 250 l/s | | | | | | | | Caudal de aire 500 l/s | | | | | | | | Caudal de aire 1200 l/s | | | | | | | |
| | 500 | 69 | 66 | 64 | 61 | 57 | 59 | 58 | 56 | 79 | 76 | 72 | 67 | 62 | 61 | 64 | 63 | 83 | 81 | 76 | 72 | 65 | 64 | 67 | 66 |
| | 300 | 66 | 63 | 60 | 58 | 53 | 54 | 53 | 49 | 77 | 73 | 68 | 63 | 57 | 56 | 59 | 58 | 81 | 77 | 72 | 68 | 60 | 59 | 61 | 60 |
| | 200 | 64 | 60 | 57 | 55 | 49 | 50 | 49 | 44 | 75 | 70 | 65 | 60 | 53 | 52 | 54 | 53 | 78 | 74 | 69 | 65 | 56 | 55 | 57 | 55 |
| | 100 | 60 | 56 | 52 | 50 | 43 | 44 | 41 | 34 | 72 | 65 | 59 | 54 | 47 | 45 | 47 | 46 | 75 | 69 | 63 | 60 | 50 | 48 | 50 | 47 |
| 50 | 56 | 51 | 47 | 45 | 37 | 37 | 34 | 25 | 69 | 61 | 54 | 49 | 40 | 38 | 39 | 38 | 71 | 64 | 58 | 55 | 43 | 41 | 42 | 39 | |
| 315 | | Caudal de aire 400 l/s | | | | | | | | Caudal de aire 800 l/s | | | | | | | | Caudal de aire 1800 l/s | | | | | | | |
| | 500 | 76 | 71 | 67 | 62 | 60 | 60 | 60 | 57 | 82 | 79 | 74 | 68 | 66 | 64 | 65 | 63 | 86 | 83 | 77 | 71 | 68 | 66 | 69 | 64 |
| | 300 | 72 | 67 | 62 | 58 | 55 | 55 | 54 | 49 | 78 | 75 | 69 | 64 | 61 | 58 | 59 | 57 | 82 | 79 | 72 | 66 | 63 | 61 | 62 | 58 |
| | 200 | 69 | 64 | 59 | 55 | 51 | 50 | 48 | 44 | 74 | 72 | 66 | 60 | 57 | 54 | 54 | 51 | 78 | 75 | 69 | 62 | 59 | 56 | 57 | 53 |
| | 100 | 63 | 58 | 53 | 49 | 45 | 43 | 39 | 34 | 69 | 66 | 60 | 54 | 51 | 46 | 46 | 43 | 73 | 67 | 62 | 56 | 52 | 51 | 49 | 44 |
| 50 | 58 | 52 | 47 | 43 | 39 | 36 | 30 | 24 | 63 | 61 | 54 | 48 | 44 | 38 | 38 | 34 | 67 | 64 | 56 | 49 | 45 | 41 | 41 | 36 | |
| 400 | | Caudal de aire 600 l/s | | | | | | | | Caudal de aire 1200 l/s | | | | | | | | Caudal de aire 75 l/s | | | | | | | |
| | 500 | 78 | 71 | 66 | 61 | 58 | 59 | 59 | 55 | 83 | 78 | 72 | 67 | 65 | 64 | 65 | 62 | 88 | 82 | 76 | 71 | 68 | 67 | 68 | 64 |
| | 300 | 73 | 67 | 61 | 57 | 54 | 54 | 53 | 48 | 77 | 73 | 67 | 62 | 60 | 59 | 59 | 56 | 84 | 78 | 71 | 66 | 64 | 62 | 63 | 58 |
| | 200 | 69 | 63 | 58 | 54 | 51 | 50 | 48 | 43 | 73 | 69 | 63 | 58 | 56 | 54 | 54 | 51 | 80 | 74 | 67 | 63 | 60 | 58 | 59 | 53 |
| | 100 | 63 | 56 | 51 | 48 | 45 | 43 | 39 | 34 | 65 | 62 | 56 | 52 | 50 | 47 | 46 | 42 | 74 | 68 | 60 | 56 | 54 | 50 | 52 | 45 |
| 50 | 56 | 50 | 45 | 43 | 40 | 36 | 31 | 25 | 58 | 55 | 49 | 45 | 43 | 39 | 38 | 34 | 68 | 62 | 54 | 50 | 48 | 43 | 45 | 37 | |
| 500 | | Caudal de aire 1000 l/s | | | | | | | | Caudal de aire 2000 l/s | | | | | | | | Caudal de aire 3000 l/s | | | | | | | |
| | 500 | 81 | 75 | 69 | 64 | 61 | 63 | 63 | 59 | 87 | 81 | 73 | 68 | 67 | 66 | 67 | 64 | 91 | 84 | 76 | 71 | 69 | 68 | 72 | 66 |
| | 300 | 76 | 70 | 64 | 60 | 57 | 57 | 57 | 51 | 82 | 75 | 67 | 63 | 62 | 60 | 61 | 58 | 86 | 79 | 70 | 66 | 64 | 62 | 64 | 59 |
| | 200 | 73 | 66 | 61 | 57 | 54 | 52 | 51 | 45 | 78 | 71 | 63 | 59 | 57 | 55 | 56 | 53 | 82 | 74 | 66 | 62 | 59 | 57 | 59 | 54 |
| | 100 | 66 | 59 | 53 | 51 | 48 | 45 | 42 | 35 | 71 | 64 | 55 | 53 | 51 | 47 | 47 | 44 | 75 | 62 | 58 | 55 | 52 | 52 | 51 | 45 |
| 50 | 60 | 53 | 47 | 45 | 42 | 37 | 33 | 26 | 65 | 56 | 48 | 46 | 44 | 38 | 39 | 35 | 69 | 60 | 51 | 49 | 45 | 40 | 43 | 36 | |
| 630 | | Caudal de aire 1500 l/s | | | | | | | | Caudal de aire 3000 l/s | | | | | | | | Caudal de aire 4500 l/s | | | | | | | |
| | 500 | 88 | 81 | 74 | 68 | 66 | 67 | 67 | 62 | 91 | 84 | 75 | 70 | 70 | 69 | 70 | 66 | 93 | 86 | 77 | 71 | 71 | 70 | 76 | 67 |
| | 300 | 82 | 75 | 68 | 63 | 61 | 60 | 60 | 54 | 85 | 78 | 69 | 65 | 65 | 62 | 63 | 59 | 87 | 80 | 71 | 65 | 65 | 63 | 65 | 60 |
| | 200 | 78 | 71 | 64 | 59 | 57 | 55 | 54 | 47 | 80 | 73 | 64 | 61 | 60 | 57 | 58 | 53 | 82 | 75 | 66 | 60 | 60 | 57 | 60 | 54 |
| | 100 | 70 | 63 | 56 | 53 | 51 | 46 | 43 | 36 | 72 | 65 | 56 | 54 | 53 | 48 | 48 | 43 | 73 | 67 | 58 | 52 | 51 | 48 | 51 | 44 |
| 50 | 63 | 56 | 49 | 46 | 44 | 38 | 33 | 25 | 64 | 57 | 48 | 47 | 46 | 39 | 39 | 33 | 65 | 59 | 50 | 44 | 43 | 38 | 42 | 34 | |

Datos técnicos

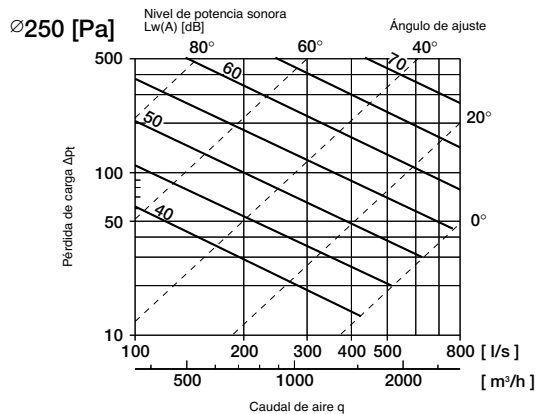
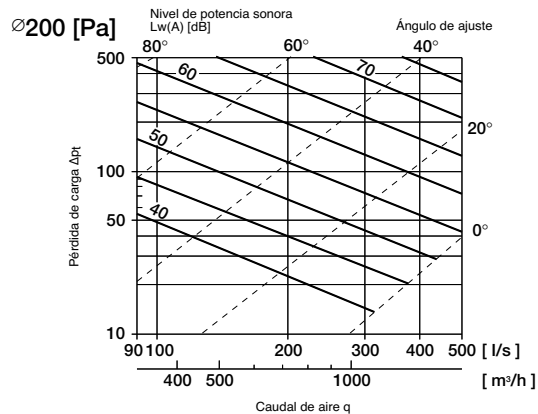
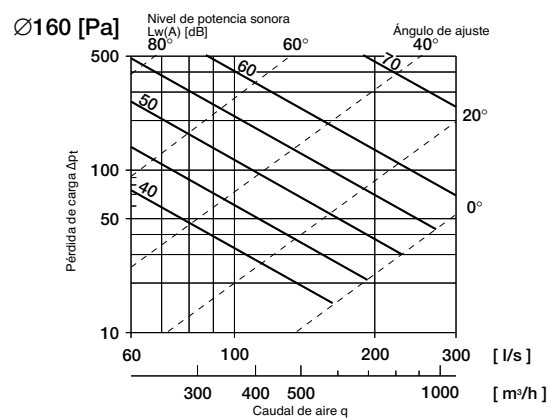
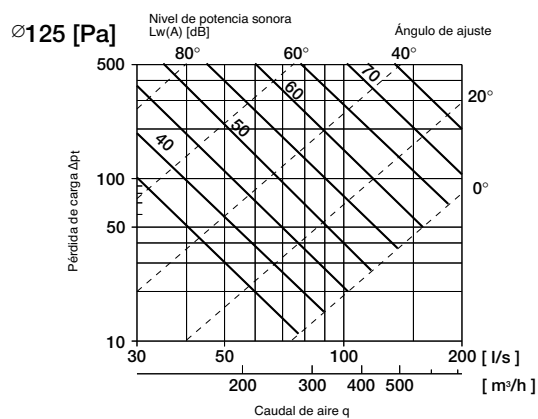
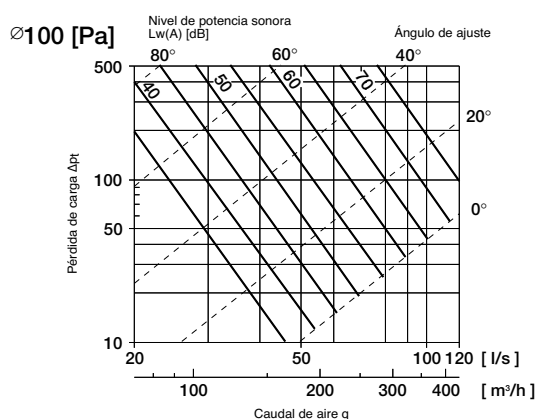
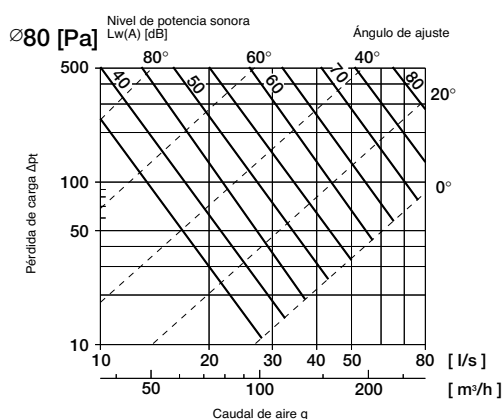
FMI con DLR

Diagramas de pérdida de carga para el dimensionado.

potencia sonora ponderado en A del tubo $L_w(A)$ en dB.

Las líneas discontinuas indican la pérdida de carga a través del medidor de caudal en función del caudal q . Las líneas continuas indican el nivel de

Nota:
Los datos de pérdida de carga relativos a la regulación difieren de estos diagramas.



Datos técnicos

